

272331US0PCT.ST25  
SEQUENCE LISTING

<110> XI, YONGZHI  
XI, CAIXIA  
<120> A FULL-LENGTH POLYNUCLEOTIDE CODING CHICKEN TYPE II COLLAGEN AND  
THE USE OF IT  
<130> 272331US0PCT  
<140> US 10/534,538  
<141> 2005-05-12  
<150> PCT/CN03/00967  
<151> 2003-11-14  
<150> CN 100039  
<151> 2002-11-14  
<160> 29  
<170> PatentIn version 3.3  
<210> 1  
<211> 5495  
<212> DNA  
<213> Gallus gallus  
<400> 1  
ccaggcaagg atggcgcacg tgtaagtggg gcacggccat ggggtgggct ggcaaaggat 60  
gctcacagag accacatcct catctctctc tctctccat agggtctgac gggtcccatt 120  
ggtccccctg gccctgctgg ccccaacggt gagaaggta gaggcagcatc acagcacccc 180  
acattacgcc ccatgggatg accccagtgc ctccacctct ccatcctttc ttttccaggg 240  
tgaatccggc cctcctggtc catctggtgc tgccggtgcc cgtggtgccc ccgtaagcac 300  
aatgtctgca gcccctgggt gcccctaacc ttcacccctaa acccccatac accccctttat 360  
caacccccc catctctttc cattagggtg agcgtggcga gcccggtgcc cccggccttg 420  
ctggatttgc tggcccccgg gtgagtgttt caccccaag ccccatcgc acacccacgt 480  
cttcacccca catcctcacc ccactcatgg tggctgttgt tcccatcagg gcgccgatgg 540  
acaacccggc gccaaaggcg agcaggaga gcccggcag aagggtgacg cggcgctcc 600  
tggtccccaa ggtccctccg ggcgtccctgg ccccccaggta caacaccaaa tggggcaaac 660  
ccccaaattt gggacgtcac ggccttcaatg caggcacact gcagctcccg ttcggatttg 720  
taacctgttt ttctctcctt ccttagggtcc aaccggtgac actggtccca aaggagctcg 780  
tggggctcag ggtccccctg tgagtaccgg ggggtgggct gcagggtggg gaaggagcgg 840  
ccgtggggct gagctgtgtc tgagccgttt ctccctctcc tctctcctct gactctgtga 900  
ttccctcccc agggagccac gggattcccc ggagctgccc gccgtgtggg accgcccggc 960  
cctaattgtga gtctgggggc gttctggat tgcccccacc tggggtttgg ggcgtgccttc 1020  
cccgcgctgc gtgttggagg gggactgttt tccctgcaca gacacgtggg gttttctcc 1080  
ttggctctct gatgttggtc tttggggcca ttccaatggt agagaaggac ttttctaagg 1140  
gcaagagctc cccaagaagc agcagtggga tgcgggtgat aaagatggaa tggctgcctc 1200

## 272331US0PCT.ST25

tggttgcac caacgctgct ttccttccct ttagggtaac ccaggcccccc ccggaccfffff	1260
cggctctgct ggcaaagacg gccccaaaggg tgttcgtggc gacgcccggcc cccccggccg	1320
tgcaggtgac cccggcctcc aaggccccgc cgcccccccc ggcgagaagg gcgaacccgg	1380
cgaggacggc cccgcggtaa ggattctggg ggtctcctcc ctccgtgcac cccctggctg	1440
cgtggtgccg ttgttcttag tctgatttcc ccctctgctg ccctgcaggg tcccgcacggc	1500
ccccccggc cctcaaggct tggcaggaca gcgtggatt gtgggtctcc caggacagcg	1560
tggtgagaga ggcttccccg gactgccggg gccatcggtg agtgggtcgc tctcatttgg	1620
gtgcactgaa tcctatgggg tgcaagatg tggggccgc gatgctctgg agcccatctc	1680
aggggtcgcc agccctttgg tgcagccgg ggacaccgtt tgcaggtggg ttggggtttt	1740
gcggagctcc ttttccccca ccaggagccg ctggtgcag gcttaaagcc gggcaggaa	1800
aaccatcagt gtttatttgt tgcaaaaaacg ataaaaaaacg gggaaaggggc	1860
agcgctgggg tctctcccac tcatgcacct cttccatc tttcagggag aacctggaaa	1920
gcaaggagcg cctggctctg cggtgaccg aggtcccccc ggccccgtgg gccccctgg	1980
gctgacaggt cctgctggag aaccggggcg cgaggtaagc aaaacccac agcatcacag	2040
ccgcaccggg catcaccaac cccatggcac agctcagctc ccagagctcc ccgggtgtctt	2100
tttctccagc actgaaagga gactttgcac aaatcctgct ccacccgggt tgtaacatcc	2160
cctttccctc ctagggcaac cctggtgctg acggcccccc aggcaaggat ggcgcagctg	2220
gcgtgaaggt gagcttgcca tgcgctcccc attggcactc gccatccccg tgccaaaagc	2280
tgtggggttt tgcacagatc tgacctctct gttgtctgct cgcaagggtga tcgtggtgag	2340
accggccctg tgggtgctcc cggtgctct ggagccccctg ggcgcgggg ccctgttggt	2400
cccactggaa aacaaggaga cagaggcgag acggtgagtg ctggcacaag gtttagggt	2460
ttagggtctc cttatggctg aaaatgtgca ggggttcccc tcaaggtttg ttccttgac	2520
cagtgtctgag tgcattaaa gatgtgtga ggcaccaaca gctgctgatt gtcactgttg	2580
cccgatctg gggtgccggag catggggctg gctcagacac ccccgaaatccaaattcat	2640
ggcttcgagg tggtgcttct ggtcgctggc acctctgtat gtccttttt tctccctgca	2700
gggtgcacaa gggccatgg gtcctctgg tcccgctgga gctcgaggaa tgccggtgag	2760
tggtgctgag tgcacatggca catccccacgt acagagcgtg gggcctgctg tgccaggagg	2820
gggtctgcca ccctgagccc gacacagccc tgtccccact ttagggtccc caaggacctc	2880
gtggtgacaa aggtgagacg ggagaggctg gagagagagg gctgaagggc caccgcggct	2940
tcacccgtct gcagggtctg cccggaccac ccgtaagttg gttggggag cactgagccc	3000
cccccccccgt acgatgcggc tcctttgggg tctctgtggc caccgaggct ctgtctggcc	3060
caaagtgtcg accgcagacg tgtgaccacc cccgcttccct cctcaggggcc cgtctggaga	3120
ccaagggtgct gccggtccccg ctggccctc cggcccaga gtaagtcctg acgggtgggt	3180
ttgggggtgg ggaaggggaa ggagcagcag tggcctccct gggcacctgc agcctctgtt	3240

## 272331US0PCT.ST25

cgctcctgtc tgctcatca	caccatcgcc ttcccgtccc	tgaggccccg caatgccttc	3300
acctccccgt tttggggctc	tctcctaggg tccccctggt	cccgtcggcc cctctggcaa	3360
agacggctct aacggcatgc	ccggccccat cggtcctccc	ggtccccgtg gacggagtgg	3420
tgaacccggc cctgcggtga	gtcctggtga ggggaggcag	ggaatggggt ccagctcgca	3480
gagcagccca tcagcatcac	ttctttctcc catagggtcc	tcctggaaac cccggcctc	3540
ccggtcctcc tggccccccc	ggcacccggca tcgacatgtc	tgctttgct ggactgggtc	3600
agacggagaa gggccccgac	cccatccgct acatggggc	agacgaggcg gccggagggc	3660
tgcggcagca cgacgtggag	gtggacgcca ccctcaaatac	cctcaacaat cagattgaga	3720
gcatccgcag ccccggggc	tccaagaaga accctgccag	gacctgccgc gacatcaaac	3780
tctgccatcc cgagtggaaag	agcggtaaga gctccgcgtg	cctctcccgt cctccctct	3840
tccccacagg agagcatccc	cagcgtcctc gcaccgacct	gcggtcaggt tggatgttag	3900
gaaagattcc ttgtccaaa	gagctctggg cgctggctg	ggctgcccgg ggaggtgggg	3960
cagtcgtgt ccccataggt	gttggggAAC tgtggagatg	tggcacttgg gagcgtggct	4020
tagtggggat gaggcagcag	ttggaccaat cttcgaggc	ttctccagtc ttaatggctc	4080
tgtgcttctg tcggtgtgca	tggtgggtat gggtggccat	ttagacttgg cgatcttga	4140
ggtctttcc gatcttaacg	actcctagac ctccccaaacc	ccatgaacgc tgttgtcct	4200
ccccctgca ggagattact	ggattgaccc gaaccaggc	tgcaccttgg acgccatcaa	4260
agtattctgc aacatggaga	caggcgagac ctgcgtctac	ccgaccccca gcagcatccc	4320
caggaagaac tggtgtgacca	gcaagacgaa agacaagaag	cacgtctggt ttgcagagac	4380
catcaacggc gtttccacg	tgggtgtccc ccgggtgtcc	ttggaaggat cgatcccacc	4440
tgggatgtcc ttcttgcgt	catgtggatg ggtttaatg	aagttataga gggtgattct	4500
gaagggtgtag gtttgggtca	gttcagctcc acaaataaaa	ggaaaggat gggatggagc	4560
aactgagctc ctcggttt	tttggccag aaaaggtgag	gatgagggga ggcctcacgg	4620
ccctacagcc cttacggcc	ctacagcagc gttagaaaa	aagttctgcc ccggagctgt	4680
gttgggcaca gaacagccct	gtgatgccgg agtcgggg	gcattgggac aacgctctca	4740
gacattgggt ttgggtcagg	tcctggtaa cgtgatgtc	agggggcaac cagccatgg	4800
gtgggcttta aggacccttc	attccatggt tctgtgatct	gtaaggacct	4860
ttccaatcca aaccactctg	attttttct cagccattt	ggaacctgaa gtacggaagt	4920
cctcccaaaa agtcctgag	agtaaggtgg tcataatgcc	cgcaggctt aactcctcac	4980
ctcttccctc cagttcagct	acggcgatga gaacctgtcc	cccaacaccg ccagcatcca	5040
gatgaccttc ctgcgcctcc	tgtccaccga gggctcccag	aacgtcacct accactgcaa	5100
gaacagcatac gcctacatgg	acgaggagac gggcaacctg	aagaaagcca tcctcatcca	5160
ggatccaac gacgtggaga	tcagagccga gggcaacagc	agttcacct acagcgtctt	5220
ggaggacggc tgcacggtag	gttgctgggc gcctgcaaag	gaaaggtgca gatggggagg	5280

## 272331US0PCT.ST25

gggaggctga ggctgggggg atgaggccgg agcagctgac agcatccctg ccctccttcc	5340
ctccccagaa acacactggc aaatggggca agacggtgat cgagtaccgg tcgcagaaga	5400
cctcgccct gcccattgt a gatattgcac ctatggacat tggcggagcc gatcaggagt	5460
ttggcgtgga tattggccca gtctgcttct tgtaa	5495

<210> 2  
<211> 4793  
<212> DNA  
<213> Gallus gallus

<400> 2 atgcacggcc gccgccccgcc c cgctccgccc gctctcccttc tcctccctcct cttctcacg	60
gccgccccaa ccgcgcagga ccgcgcaccc cgacaacctg gcccccaaggg acagaaggga	120
gaacccggag atattaaaga tttttagga ccccgagggc ctccaggacc acagggccca	180
gcaggagagc agggacacgcg aggggaccgt ggcgagaagg gggagaagg tgctcctggc	240
ccccgtggga gggatggaga acccggcacc cctggaaacc caggcccccc cggccccccc	300
ggacccctcg gcccccccg acttggtgga aactttgcgg cgagatggc gggcggttc	360
gatgagaagg cgggtggagc gcagatgggt gtcatgcagg gacccatggg ccctatggga	420
cccccgccccc cccctggccca cactggcgca cctggccccc aggattca aggcaacccc	480
ggtagccccg gcaaccccg cgctgcttgtt ccgatgggt cccggggacc tccgggacca	540
cctggaaac ccggtgacga tggtagaca ggcaaaccgg gcaaattctgg tgaacgtggc	600
ccccccggcc cccagggcgc tcgtggcttc cctgggactc ctggtctccc cggagtgaag	660
ggccaccggag gctaccccg tttggatggt gccaaggag aggccggggc tcctggagcc	720
aagggtgaat ctggttcacc gggtgagaac ggctccccc gccccatggg accccgtggg	780
ctgccccggag agcgaggacg tcccgcccc tccggcgccg ccggtgctcg tggcaatgac	840
ggtctccctg gccctgctgg accccctgg a cccgtcgcc ctgccccggagc ccccggttc	900
cccgagccc ccggtaaaa gggtgaagcc ggccccactg gtgcacgggg tcccgagggt	960
gcccaaggac cccgcggcga atccggcacc cccggctctc ccggccccgc tggcgacacc	1020
ggtaacccag ggactgtatgg catccccgtt gccaagggtt cggcggtgc cccgggcatt	1080
gcaggcgctc caggattccc cggccacgc ggccccccgg gaccccaagg tgccaccgg	1140
ccactgggac ccaaaggaca gacgggcgaa cccggcatcg caggcttcaa gggcgagcaa	1200
ggaccgaagg gcgagacggg ccccgccgga ccccaagggtt ccccccggcc ggctgggtgag	1260
gaaggcaaga gaggagctcg tggtaaacct ggtgccgccc gccctgtggg ccccccgg	1320
gaaaggggcg ctccctggcaa ccgtggattc cccgggcagg acgggtggc cggacccaag	1380
ggtgctccag gtgaacgcgg ccccgcttgtt ctgcgggtc ccaaagggtgc caccgggtac	1440
cccgacgtc ccggagagcc cggcgtggcc ggagcgaggg gtctcaccgg ccccccggc	1500
gatgcgggac ctcaaggcaa agtcggccca actgggtctc ctggcgagga tggccggcccc	1560

272331US0PCT.ST25

ggcccccccg gacctcaggg tgctcgtgg cagcctggtg tcatgggaaa ccccggtccc	1620
aaaggcgcta atggtgagcc tggaaaagct ggagagaaaag gactgcccgg cgccccaggg	1680
ctgcggggtc tgcctggcaa ggatggggag acgggagctg ccggcccccc tggaccgc	1740
ggtcctgtgg gtgagagagg agagcaagga gccccggtc ctccggctt ccagggactg	1800
cccgaccac caggtcccccc tggggagagc ggcaaacccg gagaccaggg tttccctgga	1860
gaagccggtg ccccccgtct ttttgtccc agaggtgaac gtggattccc cggtgaacgc	1920
ggctctcccg gtgccaagg gctgcagggt ccccggtggc tccccggaaac gccccggact	1980
gacggaccac agggtgcaac cggtccagcc ggccccaaacg gtgcccaggg tcccccaggg	2040
ctgcaggaa tgcccggta gagaggagca gctggcatcg ctggcctcaa ggtgaccgg	2100
ggagatgttggt gtgagaaaagg acctgaggga gctccaggca aggatggcgc acgtggtctg	2160
acgggtccca ttggtcccccc tggccctgct ggccccaaacg gtgagaaggg tgaatccggc	2220
cctccctggc catctggtgc tgccggtgcc cgtggtgccc ccggtgagcg tggcgagccc	2280
ggtccccccg gtcctgtgg atttgctggc ccccccggcg ccgatggaca acccggtgcc	2340
aaaggcgagc agggagagcc cgggcagaag ggtgacgcgg gcgtccctgg tccccaaaggt	2400
ccctccggcg ctccctggccc ccagggccca accggtgtca ctggtcccaa aggagctcg	2460
ggggctcagg gtccccctgg agccacggga ttccccggag ctgccggccg tgtgggaccg	2520
cccggcccta atggtaaccc aggccccccc ggacccctg gctctgtgg caaggacggc	2580
cccaagggtg ttcgtggcga cgccggcccc cccggccgtg caggtgaccc cggcctccaa	2640
ggccccggcg gccccccccc cgagaagggc gaacccggcg aggacggccc cgccggtccc	2700
gacggcccccc cggccctca aggcttggca ggacagcgtg gtattgtggg tctccagga	2760
cagcgtggtg agagaggctt ccccgactg ccggggccat cgggagaacc tggaaagcaa	2820
ggagcgcctg gctctgcggg tgaccgaggt ccccccggcc ccgtggggcc ccctggctg	2880
acgggtcctg ctggagaacc cggcgcgag ggcaaccctg gtgctgacgg tctccaggg	2940
agggatggcg cagctggcgt gaagggtgat cgtggtgaga ccggccctgt ggtgcccccc	3000
ggtgctcctg gagccccctgg cgccccggc cctgtggtc ccactggaaa acaaggagac	3060
agaggcgaga cgggtgcaca agggcccatg ggtccctctg gtcccgctgg agctcgagga	3120
atgccgggtc cccaaggacc tcgtggtgac aaaggtgaga cgggagaggg tggagagaga	3180
gggctgaagg gccaccgtgg cttcacgggt ctgcagggtc tgcccgacc acccggcccc	3240
tctggagacc aaggtgctgc cggtcccgct ggtccctccg gtcccgagg tccccctgg	3300
cccggtcgcc cctctggcaa agatggctct aacggcatgc ccggccccat cggcctcccc	3360
ggtccccgtg gacggagtgg tgaacccggc cctgcgggtc ctccctggaaa ccccggtcct	3420
cccggtcctc ctggcccccc cggcaccggc atcgacatgt ctgctttgc tggactgggt	3480
cagacggaga agggccccga ccccatccgc tacatgaggg cagacgaggc ggccggaggg	3540
ctgcggcagc acgacgtgga ggtggatgcc accctcaaataa ccctcaacaa tcagatttag	3600

272331US0PCT.ST25

agcatccgca	gccccgaggg	ctccaagaag	aaccctgcca	ggacactgccc	cgacatcaaa	3660
ctctgccatc	ccgagtggaa	gagcggagat	tactggattg	acccgaacca	gggctgcacc	3720
ttggacgcca	tcaaagtatt	ctgcaacatg	gagacggcg	agacactgcgt	ctacccgacc	3780
cccagcagca	tccccaggaa	gaactggtgg	accagcaaga	cgaagacaaa	gaagcacgtc	3840
tggttgcag	agaccatcaa	cggcggttc	cacttcagct	acggcgatga	gaacctgtcc	3900
cccaacacccg	ccagcatcca	gatgaccttc	ctgcgcctcc	tgtccaccga	gggctcccg	3960
aacgtcacct	accactgcaa	gaacagcatc	gcctacatgg	acgaggagac	ggcaacactg	4020
aagaagcca	tcctcatcca	gggatccaac	gacgtggaga	tcaagagccg	gggcaacagc	4080
aggttcacct	acagcgtctt	ggaggacggc	tgcacgaaac	acactggcaa	atggggcaag	4140
acggtgatcg	agtaccgggt	gcagaagacc	tcgcgcctgt	ccattgtaga	tactgcaccc	4200
atggacattg	gcggagccga	tcaggagttt	ggcgtggata	ttggcccaagt	ctgctcttg	4260
taaaaaagggt	tgttgttatt	tgtgtgttg	tttgttgtt	ggttgttgtt	tttttgttct	4320
ttttttttt	tttttagaaa	agaaaggaat	ccagccaat	cccataaaaag	caaaccagtc	4380
ccaccccccag	gacccgcacg	ttcccagcac	aacttctgca	ctgaacggat	ggcacgaccc	4440
cgcgc(cc)tt	cgggaccctc	cggcgccg	accgggcaga	ctgcgaaata	caaccacggg	4500
cttatattta	tttattgcct	tcctggagg	cctggtttcg	tagggcggtt	ggaggtggga	4560
atcaatctgg	caggtgtgac	ggccccccctc	cccacaagg	gatctggcaa	acgcaggtat	4620
cgcgaatccc	ctcccctccc	cgttatcac	cagcaggagt	gctaatgtat	catacaacag	4680
aaatggtgct	attcttgtaa	aacaagtctg	tatTTTaa	catcagttga	tataaaaaca	4740
aaaaaaaaaa	aaactttgg	tggaaagtaa	aaaaaacaaa	aaaaaaaaaa	aaa	4793

<210> 3  
<211> 1420  
<212> PRT  
<213> Gallus gallus

<400> 3

Met His Gly Arg Arg Pro Pro Arg Ser Ala Ala Leu Leu Leu Leu  
1 5 10 15

Leu Leu Leu Thr Ala Ala Ala Ala Gln Asp Arg Asp Leu Arg Gln  
20 25 30

Pro Gly Pro Lys Gly Gln Lys Gly Glu Pro Gly Asp Ile Lys Asp Val  
35 40 45

Val Gly Pro Arg Gly Pro Pro Gly Pro Gln Gly Pro Ala Gly Glu Gln  
50 55 60

Gly Gln Arg Gly Asp Arg Gly Glu Lys Gly Glu Lys Gly Ala Pro Gly  
65 70 75 80

272331US0PCT.ST25

Pro Arg Gly Arg Asp Gly Glu Pro Gly Thr Pro Gly Asn Pro Gly Pro  
85 90 95

Pro Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Leu Gly Gly Asn Phe  
100 105 110

Ala Ala Gln Met Ala Gly Gly Phe Asp Glu Lys Ala Gly Gly Ala Gln  
115 120 125

Met Gly Val Met Gln Gly Pro Met Gly Pro Met Gly Pro Arg Gly Pro  
130 135 140

Pro Gly Pro Thr Gly Ala Pro Gly Pro Gln Gly Phe Gln Gly Asn Pro  
145 150 155 160

Gly Glu Pro Gly Glu Pro Gly Ala Ala Gly Pro Met Gly Pro Arg Gly  
165 170 175

Pro Pro Gly Pro Pro Gly Lys Pro Gly Asp Asp Gly Glu Thr Gly Lys  
180 185 190

Pro Gly Lys Ser Gly Glu Arg Gly Pro Pro Gly Pro Gln Gly Ala Arg  
195 200 205

Gly Phe Pro Gly Thr Pro Gly Leu Pro Gly Val Lys Gly His Arg Gly  
210 215 220

Tyr Pro Gly Leu Asp Gly Ala Lys Gly Glu Ala Gly Ala Pro Gly Ala  
225 230 235 240

Lys Gly Glu Ser Gly Ser Pro Gly Glu Asn Gly Ser Pro Gly Pro Met  
245 250 255

Gly Pro Arg Gly Leu Pro Gly Glu Arg Gly Arg Pro Gly Pro Ser Gly  
260 265 270

Ala Ala Gly Ala Arg Gly Asn Asp Gly Leu Pro Gly Pro Ala Gly Pro  
275 280 285

Pro Gly Pro Val Gly Pro Ala Gly Ala Pro Gly Phe Pro Gly Ala Pro  
290 295 300

Gly Ser Lys Gly Glu Ala Gly Pro Thr Gly Ala Arg Gly Pro Glu Gly  
305 310 315 320

Ala Gln Gly Pro Arg Gly Glu Ser Gly Thr Pro Gly Ser Pro Gly Pro  
325 330 335

Ala Gly Ala Pro Gly Asn Pro Gly Thr Asp Gly Ile Pro Gly Ala Lys  
340 345 350

272331US0PCT.ST25

Gly Ser Ala Gly Ala Pro Gly Ile Ala Gly Ala Pro Gly Phe Pro Gly  
355 360 365

Pro Arg Gly Pro Pro Gly Pro Gln Gly Ala Thr Gly Pro Leu Gly Pro  
370 375 380

Lys Gly Gln Thr Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln  
385 390 395 400

Gly Pro Lys Gly Glu Thr Gly Pro Ala Gly Pro Gln Gly Ala Pro Gly  
405 410 415

Pro Ala Gly Glu Glu Gly Lys Arg Gly Ala Arg Gly Glu Pro Gly Ala  
420 425 430

Ala Gly Pro Val Gly Pro Pro Gly Glu Arg Gly Ala Pro Gly Asn Arg  
435 440 445

Gly Phe Pro Gly Gln Asp Gly Leu Ala Gly Pro Lys Gly Ala Pro Gly  
450 455 460

Glu Arg Gly Pro Ala Gly Leu Ala Gly Pro Lys Gly Ala Thr Gly Asp  
465 470 475 480

Pro Gly Arg Pro Gly Glu Pro Gly Leu Pro Gly Ala Arg Gly Leu Thr  
485 490 495

Gly Arg Pro Gly Asp Ala Gly Pro Gln Gly Lys Val Gly Pro Thr Gly  
500 505 510

Ala Pro Gly Glu Asp Gly Arg Pro Gly Pro Pro Gly Pro Gln Gly Ala  
515 520 525

Arg Gly Gln Pro Gly Val Met Gly Phe Pro Gly Pro Lys Gly Ala Asn  
530 535 540

Gly Glu Pro Gly Lys Ala Gly Glu Lys Gly Leu Pro Gly Ala Pro Gly  
545 550 555 560

Leu Arg Gly Leu Pro Gly Lys Asp Gly Glu Thr Gly Ala Ala Gly Pro  
565 570 575

Pro Gly Pro Ala Gly Pro Val Gly Glu Arg Gly Glu Gln Gly Ala Pro  
580 585 590

Gly Pro Ser Gly Phe Gln Gly Leu Pro Gly Pro Pro Gly Pro Pro Gly  
595 600 605

Glu Ser Gly Lys Pro Gly Asp Gln Gly Val Pro Gly Glu Ala Gly Ala  
610 615 620

272331US0PCT.ST25

Pro Gly Leu Val Gly Pro Arg Gly Glu Arg Gly Phe Pro Gly Glu Arg  
625 630 635 640

Gly Ser Pro Gly Ala Gln Gly Leu Gln Gly Pro Arg Gly Leu Pro Gly  
645 650 655

Thr Pro Gly Thr Asp Gly Pro Lys Gly Ala Thr Gly Pro Ala Gly Pro  
660 665 670

Asn Gly Ala Gln Gly Pro Pro Gly Leu Gln Gly Met Pro Gly Glu Arg  
675 680 685

Gly Ala Ala Gly Ile Ala Gly Leu Lys Gly Asp Arg Gly Asp Val Gly  
690 695 700

Glu Lys Gly Pro Glu Gly Ala Pro Gly Lys Asp Gly Ala Arg Gly Leu  
705 710 715 720

Thr Gly Pro Ile Gly Pro Pro Gly Pro Ala Gly Pro Asn Gly Glu Lys  
725 730 735

Gly Glu Ser Gly Pro Pro Gly Pro Ser Gly Ala Ala Gly Ala Arg Gly  
740 745 750

Ala Pro Gly Glu Arg Gly Glu Pro Gly Ala Pro Gly Pro Ala Gly Phe  
755 760 765

Ala Gly Pro Pro Gly Ala Asp Gly Gln Pro Gly Ala Lys Gly Glu Gln  
770 775 780

Gly Glu Pro Gly Gln Lys Gly Asp Ala Gly Ala Pro Gly Pro Gln Gly  
785 790 795 800

Pro Ser Gly Ala Pro Gly Pro Gln Gly Pro Thr Gly Val Thr Gly Pro  
805 810 815

Lys Gly Ala Arg Gly Ala Gln Gly Pro Pro Gly Ala Thr Gly Phe Pro  
820 825 830

Gly Ala Ala Gly Arg Val Gly Pro Pro Gly Pro Asn Gly Asn Pro Gly  
835 840 845

Pro Pro Gly Pro Pro Gly Ser Ala Gly Lys Asp Gly Pro Lys Gly Val  
850 855 860

Arg Gly Asp Ala Gly Pro Pro Gly Arg Ala Gly Asp Pro Gly Leu Gln  
865 870 875 880

Gly Pro Ala Gly Pro Pro Gly Glu Lys Gly Glu Pro Gly Glu Asp Gly  
885 890 895

272331US0PCT.ST25

Pro Ala Gly Pro Asp Gly Pro Pro Gly Pro Gln Gly Leu Ala Gly Gln  
900 905 910

Arg Gly Ile Val Gly Leu Pro Gly Gln Arg Gly Glu Arg Gly Phe Pro  
915 920 925

Gly Leu Pro Gly Pro Ser Gly Glu Pro Gly Lys Gln Gly Ala Pro Gly  
930 935 940

Ser Ala Gly Asp Arg Gly Pro Pro Gly Pro Val Gly Pro Pro Gly Leu  
945 950 955 960

Thr Gly Pro Ala Gly Glu Pro Gly Arg Gly Asn Pro Gly Ala Asp  
965 970 975

Gly Leu Pro Gly Arg Asp Gly Ala Ala Gly Val Lys Gly Asp Arg Gly  
980 985 990

Glu Thr Gly Pro Val Gly Ala Pro Gly Ala Pro Gly Ala Pro Gly Ala  
995 1000 1005

Pro Gly Pro Val Gly Pro Thr Gly Lys Gln Gly Asp Arg Gly Glu  
1010 1015 1020

Thr Gly Ala Gln Gly Pro Met Gly Pro Ser Gly Pro Ala Gly Ala  
1025 1030 1035

Arg Gly Met Pro Gly Pro Gln Gly Pro Arg Gly Asp Lys Gly Glu  
1040 1045 1050

Thr Gly Glu Ala Gly Glu Arg Gly Leu Lys Gly His Arg Gly Phe  
1055 1060 1065

Thr Gly Leu Gln Gly Leu Pro Gly Pro Pro Gly Pro Ser Gly Asp  
1070 1075 1080

Gln Gly Ala Ala Gly Pro Ala Gly Pro Ser Gly Pro Arg Gly Pro  
1085 1090 1095

Pro Gly Pro Val Gly Pro Ser Gly Lys Asp Gly Ser Asn Gly Met  
1100 1105 1110

Pro Gly Pro Ile Gly Pro Pro Gly Pro Arg Gly Arg Ser Gly Glu  
1115 1120 1125

Pro Gly Pro Ala Gly Pro Pro Gly Asn Pro Gly Pro Pro Gly Pro  
1130 1135 1140

Pro Gly Pro Pro Gly Thr Gly Ile Asp Met Ser Ala Phe Ala Gly  
1145 1150 1155

272331US0PCT.ST25

Leu Gly Gln Thr Glu Lys Gly Pro Asp Pro Ile Arg Tyr Met Arg  
1160 1165 1170

Ala Asp Glu Ala Ala Gly Leu Arg Gln His Asp Val Glu Val  
1175 1180 1185

Asp Ala Thr Leu Lys Ser Leu Asn Asn Gln Ile Glu Ser Ile Arg  
1190 1195 1200

Ser Pro Glu Gly Ser Lys Lys Asn Pro Ala Arg Thr Cys Arg Asp  
1205 1210 1215

Ile Lys Leu Cys His Pro Glu Trp Lys Ser Gly Asp Tyr Trp Ile  
1220 1225 1230

Asp Pro Asn Gln Gly Cys Thr Leu Asp Ala Ile Lys Val Phe Cys  
1235 1240 1245

Asn Met Glu Thr Gly Glu Thr Cys Val Tyr Pro Thr Pro Ser Ser  
1250 1255 1260

Ile Pro Arg Lys Asn Trp Trp Thr Ser Lys Thr Lys Asp Lys Lys  
1265 1270 1275

His Val Trp Phe Ala Glu Thr Ile Asn Gly Gly Phe His Phe Ser  
1280 1285 1290

Tyr Gly Asp Glu Asn Leu Ser Pro Asn Thr Ala Ser Ile Gln Met  
1295 1300 1305

Thr Phe Leu Arg Leu Leu Ser Thr Glu Gly Ser Gln Asn Val Thr  
1310 1315 1320

Tyr His Cys Lys Asn Ser Ile Ala Tyr Met Asp Glu Glu Thr Gly  
1325 1330 1335

Asn Leu Lys Lys Ala Ile Leu Ile Gln Gly Ser Asn Asp Val Glu  
1340 1345 1350

Ile Arg Ala Glu Gly Asn Ser Arg Phe Thr Tyr Ser Val Leu Glu  
1355 1360 1365

Asp Gly Cys Thr Lys His Thr Gly Lys Trp Gly Lys Thr Val Ile  
1370 1375 1380

Glu Tyr Arg Leu Gln Lys Thr Ser Arg Leu Ser Ile Val Asp Thr  
1385 1390 1395

Ala Pro Met Asp Ile Gly Gly Ala Asp Gln Glu Phe Gly Val Asp  
1400 1405 1410

Ile Gly Pro Val Cys Phe Leu  
 1415 1420

<210> 4  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic DNA

<400> 4  
 tctatcgcbc acccgtttg c

21

<210> 5  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic DNA

<400> 5  
 gtctttagt gctacggctt gc

22

<210> 6  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic DNA

<400> 6  
 ttgcagatgt ctccaaatacc ag

22

<210> 7  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic DNA

<400> 7  
 gcacaacggc tcgggcaatg tgctaacg

28

<210> 8  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic DNA

<400> 8  
 gctcgaaagc aacggcctcg

20

<210> 9  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 9  
ctcgtcaagc aacggcctcg 20

<210> 10  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 10  
cgctgcgatc gtcatgcgg 19

<210> 11  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 11  
gtagtgaccc tacgccccgag 20

<210> 12  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 12  
acgccccgctc tcgtgctcct cgtggtg 28

<210> 13  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 13  
ccgccccgggt ccgaatgccc gcat 24

<210> 14  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 14  
ccaggcaagg atggcgcacg 20

<210> 15		
<211> 28		
<212> DNA		
<213> Artificial Sequence		
<220>		
<223> Synthetic DNA		
<400> 15		28
cctgatcggc tccgccaatg tccatagg		
<210> 16		
<211> 20		
<212> DNA		
<213> Artificial Sequence		
<220>		
<223> Synthetic DNA		
<400> 16		20
gcagaggtgc tgcccagaac		
<210> 17		
<211> 21		
<212> DNA		
<213> Artificial Sequence		
<220>		
<223> Synthetic DNA		
<400> 17		21
tcactccttg gatgccatgt g		
<210> 18		
<211> 24		
<212> DNA		
<213> Artificial Sequence		
<220>		
<223> Synthetic DNA		
<400> 18		24
ggtaccttgg tggaaacttt gcgg		
<210> 19		
<211> 24		
<212> DNA		
<213> Artificial Sequence		
<220>		
<223> Synthetic DNA		
<400> 19		24
ggtaccgtta caagaagcag actg		
<210> 20		
<211> 24		
<212> DNA		
<213> Artificial Sequence		
<220>		
<223> Synthetic DNA		

<400> 20  
agatactgct acgaaagacc ccga

24

<210> 21  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 21  
ctctcttgggt tgtagccctc atctg

25

<210> 22  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 22  
gcggccgcag atactgctac gaaag

25

<210> 23  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 23  
gcggccgcct ctcttggttg tagg

24

<210> 24  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 24  
gcggccgcac agcccctgga ggag

24

<210> 25  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 25  
gcggccgcgg tgatgttagat cagtc

25

<210> 26  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 26  
gcggccgcga tactgctacg aaag

24

<210> 27  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 27  
gcggccgcct ccaactctga taac

24

<210> 28  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 28  
gcggccgcct gcccctggag gag

23

<210> 29  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic DNA

<400> 29  
gcggccgcct aatcatcatc agc

23